DOCUMENT RESUME

ED 475 026 HE 035 787

AUTHOR	Collins, Kathleen M. T.; Onwuegbuzie, Anthony J.
TITLE	Levels of Reading Ability among African-American Graduate Students.
PUB DATE	2002-11-00
NOTE	26p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (Chattanooga, TN, November 6-8, 2002).
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS	*Academic Achievement; *Black Students; *Graduate Students; Graduate Study; Reading Ability; *Reading Comprehension; *Vocabulary
IDENTIFIERS	*African Americans

ABSTRACT

Poor reading ability has been identified as a predictor of underachievement among undergraduate students, but little is known about the reading ability of graduate students, especially those of minority background. This study examined the reading comprehension and reading vocabulary of 105 African American graduate students at a historically black college. Their scores were compared to those of two samples of Caucasian graduate students and a large normative sample of undergraduates. The African American students obtained statistically significantly lower scores in reading comprehension and vocabulary than did the comparison groups. A canonical correlation analysis revealed a strong relationship between these reading ability variables and achievement in research methodology courses. (Contains 3 tables and 42 references.) (Author/SLD)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 475 026

Running head: READING COMPREHENSION AMONG AFRICAN AMERICANS

Levels of Reading Ability Among African-American Graduate Students

Kathleen M. T. Collins

University of Arkansas at Fayetteville

Anthony J. Onwuegbuzie

Howard University

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

A. Onwuegbuzie

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Correspondence should be addressed to Kathleen M. T. Collins, College of Education and Health Professions, Dept. of Curriculum and Instruction, 201 Graduate Education Building, University of Arkansas, Fayetteville, AR 72701, or E-Mail: (kcollinsknob@cs.com).

Paper presented at the annual meeting of the Mid-South Educational Research Association, Chattanooga, TN, November 7, 2002.

BEST COPY AVAILABLE

TM035787

Abstract

Poor reading ability has been identified as a predictor of underachievement among undergraduate students. However, little is known about the reading ability of graduate students, likely because many educators assume that these students, who are among the highest academic achievers, have adequate reading skills. Moreover, the few studies in the area of reading conducted on graduate students have focused either exclusively or at least primarily on Caucasian-American students. In contrast, there is scant research evaluating the impact of reading ability on the achievement of minority graduate students, specifically African–American students. To address this limitation, the purpose of this inquiry was to examine 105 African-American graduate students' levels of reading comprehension and reading vocabulary. A canonical correlation analysis revealed a strong relationship between these reading ability variables and achievement in research methodology courses. Implications are discussed.

Levels of Reading Ability Among African-American Graduate Students

Poor reading ability has been identified as a cause of underachievement among undergraduate students (Brown & Day, 1983; DuBoulay, 1999; Lammers, Onwuegbuzie, & Slate, 2000; Van Lanen, Lockie, & McGannon, 2000). Although, reading deficiencies often are not identified until undergraduate students are far advanced into their programs of study (DuBoulay, 1999), paradoxically, outcomes associated with reading ability are evaluated both formally and informally throughout students' college and career experiences (Brown, Fishco, & Hanna, 1993; DuBoulay, 1999; Prichard, Romeo, & Muller, 1999; Zhu, 1999).

The corpus of literature assessing the relationship between reading ability and achievement has focused primarily on undergraduates (Baker, 1985; DuBoulay, 1999; Wood, 1982). For example, Baker (1985) documented that undergraduates with lower verbal abilities had difficulty integrating information from written text with previously acquired knowledge, and experienced difficulty identifying inconsistencies across ideas (i.e., comprehension monitoring) presented in the text. DuBoulay (1999) contends that undergraduates' difficulties with the process of reading is intensified by the quantity of reading required at the college level.

In the research on reading ability, comprehension monitoring is considered a crucial component of the reading process and it has been operationalized as a two-dimensional construct defined as evaluation and regulation of comprehension (Baker, 1985; Brown, 1980; Zabrucky, & Ratner, 1992). Evaluation refers to an individual's self-awareness of their understanding of written text. Regulation refers to the reader's implementation of strategies designed to elevate comprehension of text material, such as

re-reading complicated text to ensure understanding. Consequently, in the context of the reading process, comprehension monitoring is implemented when the reader experiences difficulty understanding the meaning of the written text. This process also has been termed self-regulated comprehension (Hacker, 1998).

In the context of graduate-level education, specifically in educational research courses, students are provided opportunities to become proficient in reading and critically evaluating research material (e.g., primary and secondary scientific sources) and to apply critical elements from these sources toward creating credible research studies (Ravid & Leon, 1995). However, after taking research methodology courses, many graduate students express reservations regarding the degree that their courses provided sufficient preparation to understand or to implement research (Fleming, 1988; Green & Kvidahl, 1990; Rackliffe, 1988).

Recently, research has been conducted to investigate the extent to which graduate students' reading ability predicts their performance in research methodology courses (Collins & Onwuegbuzie, 2002; Onwuegbuzie & Collins, 2002; Onwuegbuzie, Slate, & Schwartz, 2000). Results of research conducted by Onwuegbuzie et al. (2000) indicated a moderate positive relationship between graduate students' reading ability and achievement in research methodology courses. Moreover, analyzing self-report data, these researchers noted that the graduate students demonstrated limited comprehension monitoring in their reading of research methodology textbooks.

In another study, Onwuegbuzie and Collins (2002) compared the scores of graduate students enrolled in a research methodology course on the Nelson-Denny Reading Test (NDRT) (Brown, Fishco, & Hanna, 1993) to scores obtained from a

normative sample of 5,000 undergraduates. Their findings indicated that the graduate students achieved statistically significantly higher reading comprehension scores in contrast to the undergraduate sample. The effect size (Cohen's [1988] *d*) associated with this difference was .71 (Hedges & Olkin's [1985] z-based 95% Confidence Interval [CI]=.45, .97). In the comparative analysis of graduate students and the normative sample's reading vocabulary scores, the graduate students attained statistically significantly higher scores than did the undergraduate sample. The effect size associated with this difference was .45 (95% CI =.19, .71). However, Onwuegbuzie and Collins (2002) noted that a small proportion of graduate students' reading comprehension and vocabulary scores was very low. Specifically, the graduate sample's lowest scores, in contrast to the normative sample, represented the 14th and 24th percentiles, respectively.

In a follow-up study, Collins and Onwuegbuzie (2002) investigated reading ability, specifically reading comprehension and reading vocabulary, as a predictor of graduate students' understanding of research concepts, methodologies, and applications. A canonical correlation analysis revealed that both reading comprehension and reading vocabulary were moderate significant predictors of students' understanding of research concepts, methodologies, and applications sharing 10.9% of the variance. Both measures of reading ability (i.e., comprehension and vocabulary) made a significant contribution toward predicting graduate students' performance in research methodology courses--with comprehension being the major contributor. To the degree that this relationship is causal, Collins and Onwuegbuzie (2002) interpreted these results to indicate that problems experienced by graduate students in their understanding of

research methodology course content may be the result of poor reading ability, specifically in the area of comprehension.

A limitation in the research in the area of reading ability and achievement level is that the empirical focus has been on Caucasian graduate students. In contrast, there is scant research evaluating the impact of reading ability on the achievement of minority graduate students in general and African-American graduate students in particular. Indeed, a review of the electronic data-bases utilizing as descriptors: "African-American," "cognitive processes," "college," "graduate," "research," "reading strategies," "comprehension," and "NDRT" did not produce a single study utilizing reading comprehension as a predictor of achievement for African-American graduate students.

To address this limitation, the purpose of this inquiry was to examine 105 African-American graduate students' levels of reading comprehension and reading vocabulary by comparing their scores on the NDRT to scores obtained by two samples of Caucasian graduate students and a large normative sample of undergraduates. The second and major purpose of the investigation was to determine whether reading comprehension and reading ability predict the performance of African-American graduate students in quantitative-based research methodology courses. In essence then, the study represents a replication of Collins and Onwuegbuzie (2002), using a minority sample—specifically, African-American graduate students.

Method

Participants

This investigation was based on responses from graduate students at a Historically Black College and University. The sample comprised 105 African-American

graduate students enrolled in counseling psychology, school psychology, or educational psychology programs. All participants were enrolled in a quantitative-based research methodology course in the areas of statistics or measurement. The majority of the sample was female (70.1%). Ages of the participants ranged from 22 to 62 (M = 30.44, SD = 8.74).

Instruments and Procedure

All participants were administered the NDRT (Form G) on the first day of class. The NDRT was used in this study to measure reading vocabulary and reading comprehension. This instrument contains 118 items that are divided into two subtests, Vocabulary, which consists of 80 items, and Comprehension, which consists of 38 items, and seven reading passages (Brown et al., 1993). Each item on the NDRT contains five response options. For the present investigation, score reliability, as measured by KR-20, was .97 (95% confidence interval [CI] = .96, .98) for the reading vocabulary test and .96 (95% CI = .95, .97) for the reading comprehension test.

Analysis

A series of independent t-tests was used to compare scores on the reading comprehension and reading vocabulary sections of the NDRT between the African American graduate sample and the three comparison groups. The Bonferonni adjustment was used to maintain a familywise error rate of 5% (Onwuegbuzie & Daniel, 2002, in press). Effect sizes, as measured by Cohen's (1988) d and its associated confidence interval, were reported for all statistically significant findings. In order to address the second purpose of the study, namely, assessing the predictability of reading comprehension and reading vocabulary, a canonical correlation analysis was undertaken.

This analytical technique examines the number and nature of the relationship between two sets of variables. Specifically, the present inquiry investigated the multivariate relationship between reading comprehension and reading vocabulary and students' understanding of research concepts, methodologies, and applications.

Results

Table 1 presents the means and standard deviations pertaining to reading ability (i.e., reading comprehension and reading vocabulary) scores and achievement at the midpoint and end of the research methodology course. Table 2 displays the reading comprehension and reading vocabulary scores for the current study, as well as the three comparison studies. Of particular interest is the relatively large standard deviations pertaining to the present sample.

Insert Table 1 about here

Insert Table 2 about here

A series of independent *t*-tests, after applying the Bonferroni adjustment, revealed that the African-American graduate students obtained statistically significantly lower scores on the reading comprehension portion of the NDRT than did all three comparison groups, namely, (a) the normative sample of 5,000 undergraduate students from 38 institutions studied by Brown et al. (1993) ($t = -3.01$, $p < .001$); (b) Onwuegbuzie and Collins' (2002) sample of 59 Caucasian-American graduate students ($t = -4.75$, $p <$

.0001); and (c) Collins and Onwuegbuzie's (2002) sample of 71 Caucasian-American graduate students (t = -5.58, p < .0001). The Cohen's (1988) d effect sizes associated with these differences were 0.30 (Hedges & Olkin's [1985] z-based 95% Confidence Interval [CI]= 0.11, 0.49), 0.77 (95% CI = 0.44, 1.10), and 0.80 (95% CI = 0.51, 1.09), respectively, indicating a small difference pertaining to the first comparison and large differences for the latter two comparisons.

Similarly, the African-American graduate students obtained statistically significantly lower scores on the reading vocabulary portion of the NDRT than did all three comparison groups, namely, (a) Brown et al. (1993) (t = -4.59, p < .0001); (b) Onwuegbuzie and Collins (2002) (t = -4.21, p < .0001); and (c) Collins and Onwuegbuzie (2002) (t = -4.75, p < .0001). The Cohen's (1988) d effect sizes associated with these differences were 0.45 (CI = 0.26, 0.64), 0.68 (95% CI = 0.35, 1.01), and 0.68 (95% CI = 0.39, 0.97), respectively, indicating a moderate difference pertaining to the first comparison and moderate-to-large differences for the latter two comparisons.

Table 3 presents the inter-correlational matrix involving the two independent variables (i.e., reading comprehension and reading vocabulary) and the two dependent variables (i.e., midterm and final achievement scores). Of particular note is the statistically significant correlation between reading comprehension and reading vocabulary after applying the Bonferroni adjustment to control for Type I error. Using Cohen's criteria, this relationship indicated a very large effect size.

Insert Table 3 about here

The correlation matrix in table three was the basis of the canonical correlation analysis. This goal of this analysis was to determine the degree to which the reading ability variables were related to the achievement variables. Canonical correlation analyses provide indices of both statistical significance and practical significance. The significance of the canonical roots was tested via the *F*-statistic based on Rao's approximation (Rao, 1952).

The canonical analysis revealed that both canonical correlations combined were statistically significant ($F[4, 134] = 2.96$, $p < .0001$; Wilks' Lambda = .74). However, when the first canonical root was excluded, the remaining canonical root was not statistically significant. Together, these results imply that the first canonical function was statistically significant, but the second canonical root was not statistically significant. However, because statistical significance is influenced by the sample size, particular attention should be given to the practical significance (i.e., effect size) of the obtained results (Thompson, 1980). One of the effect sizes used in canonical correlation analyses is the proportion of variance shared (Thompson, 1980, 1984, 1988, 1990). Specifically, the canonical correlation indicates how much variance the sets of weighted original variables share with each other (Thompson, 1988). In the current investigation, the first canonical correlation ($R_{c1} = .51$) was extremely educationally significant, contributing 26.2% (i.e., R_{c1}^2) to the shared variance. However, the second canonical correlation ($R_{c2} = .05$) did not appear to be educationally significant. Consequently, only the first canonical correlation was interpreted.

Data pertaining to the canonical root are presented in Table 4. This table provides both standardized function coefficients and structure coefficients, as recommended by

researchers (e.g., Onwuegbuzie & Daniel, in press; Thompson, 1990). An examination of the standardized canonical function coefficients revealed that, using a cutoff correlation of 0.3 recommended by Lambert and Durand (1975) as an acceptable minimum loading value, both reading comprehension and reading vocabulary made similarly important contributions to the achievement composite. With respect to the achievement set, only the final scores made an important contribution to the composite set.

Insert Table 4 about here

The structure coefficients (Table 4) indicated that both reading ability dimensions made important contributions to the first canonical variate. The square of the structure coefficient (Table 4) indicated that reading comprehension and reading vocabulary made large contributions, explaining 81.0% and 86.0% of the variance, respectively. With respect to the research methodology achievement cluster, both the midterm and final scores made noteworthy contributions, with the final scores making an extremely large contribution--explaining 98.0% of the variance.

Discussion

Replication is the essence of science (Onwuegbuzie & Daniel, 2002). Indeed, true external replication studies make extremely important contributions to the accumulation of knowledge in a specific domain relative to a statistically significant finding arising from a single study (Robinson & Levin, 1997). As noted by Levin (1995), a replication is worth a *p* value to the thousandth decimal place. As such, the present investigation, which led to replicated findings, has made a valuable contribution to the

literature base in the area of reading ability among the adult population. Specifically, Collins and Onwuegbuzie (2002) found that reading comprehension and reading vocabulary simultaneously were predictors of performance in research methodology courses among Caucasian-American graduate students. In the current study, reading comprehension and reading vocabulary also were related simultaneously to achievement in research methodology courses. However, in this case, the sample involved African-American graduate students—a subgroup that has received scant attention by researchers (Graham, 1992; Onwuegbuzie, 1999a), a despite the fact that African-American graduate students have been found to report significantly higher levels of anxiety (Onwuegbuzie, 1999a) and to attain significantly lower levels of achievement (Onwuegbuzie, 1999b) in research methodology courses than do their Caucasian-American counterparts.

Interestingly, the multivariate relationship found in the present inquiry (26.2% of the variance shared) was much larger than that documented in Collins and Onwuegbuzie's (2002) study (10.9% of the variance shared). To the extent that this relationship is causal, that is, to the extent that reading ability is a cause of underachievement in research methodology courses, this present association is even more compelling. Moreover, the fact that this relationship between reading ability and performance in research methodology courses was replicated via a very different sample (i.e., African-American graduate students) provides incremental validity to Collins and Onwuegbuzie's (2002) result, thereby suggesting that this relationship represents a very real phenomenon among graduate students. Nevertheless, this study should be

replicated further on other minority subgroups, especially among graduate students whose native language is not English.

The prevailing relationship also is consistent with researchers who have found that domain expertise is important for use of adequate reading comprehension strategies (Baker, 1989). According to Baker (1989), in an attempt to understand the text, readers who are not familiar with a content domain often rely on word understanding, instead of utilizing effective comprehension strategies such as setting goals, examining text to recognize existing knowledge, establishing a set of strategies for receiving new information, and self-monitoring learning. Moreover, domain expertise influences the use of metacognitive strategies not only via knowledge of the type of text but also via knowledge of the content and subject matter (Baker, 1989). Unfortunately, many students find the material covered in quantitative-based research methodology courses to be far removed from their fields of specialization (Onwuegbuzie, DaRos, & Ryan, 1997); therefore, it is likely that for many graduate students enrolled in these classes, effective comprehension strategies are replaced by word understanding.

Bearing in mind the relationship between reading ability and achievement documented in the present study, the finding that the African-American sample attained lower levels of reading comprehension and reading vocabulary than did all three comparison groups, including the undergraduate sample, is particularly disturbing. Indeed, the relatively large standard deviations pertaining to both these variables likely explains, at least in part, the stronger ability-achievement link found. Even more disturbing is the fact that 13.73% of the African-American sample attained reading vocabulary scores that represented the 1st percentile of Brown et al.'s (1993)

undergraduate norms, while 11.75% of the study participants attained reading comprehension scores representing the 1st percentile. According to the canonical correlation analysis, these students were most at risk for attaining low levels of achievement in research methodology courses. This low reading ability group clearly should be the subject of future investigations. For example, researchers could investigate whether these students are more likely to perform at the lowest levels in all courses that require the understanding of relatively complex material. It is likely that these students are more likely to use inefficient reading and metacognitive strategies, making it difficult for them to comprehend complex textbook information, thereby unduly affecting their achievement in courses (DuBoulay, 1999). However, only in-depth research can unravel such a process. Indeed, qualitative research can play an extremely important role here.

Bereiter and Bird (1985) have identified four strategies used by good readers that help poor readers: (a) restatement, in which the reader rephrases the text into simpler terms, (b) backtracking, wherein previous text is reviewed, (c) examining relationships, in which information is identified that should be clarified in subsequent text, and such a clarification is sought; and (d) problem formulation, in which a specific difficulty is identified as a problem that needs resolution. It is possible that the higher achievers in research methodology courses are more apt to use one or more of these strategies than are their lower-achieving counterparts, who also have lower levels of reading ability. This is worthy of investigation.

Similarly, Spring (1985) documented that poor readers less frequently (a) relate text information to prior knowledge, (b) identify logical relationships among text material, and (c) mentally identify important information. Spring also found that poor readers were

less likely to react emotionally and critically to material that they read than were their counterparts. Consequently, it would be useful to find out whether these findings generalize to graduate students.

Currently, the authors of this present investigation are conducting longitudinal research tracking academic achievement of members of the sample who attained extremely low reading comprehension and reading vocabulary scores on the NDRT. The goal is to evaluate their academic achievement across all courses in their graduate programs. Also of interest are their reading habits and attitudes towards reading over time. The other members of the present sample also are being tracked for comparison purposes. The information gleaned from this longitudinal investigation should help to determine the overall impact of poor reading ability on African-American students' ability to complete successfully their graduate degrees.

According to the United States Department of Education (1995), approximately 8% of first-year students at public four-year colleges and between 5% and 10% of first-year students in private colleges begin their studies with poor reading comprehension strategies and, consequently, enroll in developmental and remedial reading classes. The present investigation, alongside that of Collins and Onwuegbuzie (2002), provide evidence that a small but significant proportion of graduate students are inadequately prepared for the academic literacy requirements that typify the coursework in graduate programs in the social and behavioral sciences. Further, these students are at risk for attaining the lowest levels of performance in courses such as research methodology.

An important implication of this study is that the NDRT appears to be a useful instrument for identifying graduate students who are most likely to experience reading

difficulties. As such, program coordinators, advisors, and others responsible for helping the transition of students as they enter graduate school should consider using the NDRT as a screening tool. Interestingly, a number of colleges have successfully used the NDRT as a screening instrument for undergraduate students (Brown et al., 1993). It is possible that this measure also can help graduate students with poor reading ability, especially if those who are identified as such are provided with developmental assistance. Such reading interventions could include metacognitive instruction in reading coupled with training in reading skills, because this combination has been found to be effective (Applegate, Quinn, & Applegate, 1994; Baker & Brown, 1984). In addition, these interventions should instill the value of acquiring metacognitive skills and strategies since such an appreciation has been found to increase the likelihood of students applying them in their readings (Kelly, Albertini, & Shannon, 2001). At every step of the process, the effectiveness of these interventions should be studied and replicated. For it is only by documenting and replicating the effects of reading interventions can best practices for improving the reading comprehension of graduate students be disseminated.

References

Applegate, M. D., Quinn, K. B., & Applegate, A. J. (1994). Using metacognitive strategies to enhance achievement for at-risk liberal arts college students. *Journal of Reading, 38*, 32-40.

Baker, L. (1985). How do we know when we don't understand? Standards for evaluating text comprehension. In D. L. Forrest-Pressley, G. E. MacKinnon, & T. G. Waller (Eds.), *Metacognition, cognition, and human performance* (pp. 155-205). New York: Academic.

Baker, L. (1989). Metacognition, comprehension monitoring, and the adult reader. *Educational Psychology Review, 1*, 3-38.

Baker, L., & Brown, A. L. (1984). Metacognitive skills and reading. In. P. D. Pearson, R. Barr, M. L. Kamil, & P. Mosenthal (Eds.), *Handbook of reading research* (pp. 353-394). New York: Longman.

Bereiter, C., & Bird, M. (1985). Use of thinking aloud in identification and teaching of reading comprehension strategies. *Cognition and Instruction, 2*, 131-156.

Brown, A. L. (1980). Metacognitive development and reading. In R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension* (pp. 453-481). Hillsdale, NJ: Lawrence Erlbaum Associates.

Brown, A. L., & Day, J. J. (1983). *Macrorules for summarizing texts: The development of expertise (Tech Rep No. 270)*. Urbana: University of Illinois, Center for the Study of Reading.

Brown, J. I., Fishco, V. V., & Hanna, G. (1993). *Nelson-Denny Reading Test: Manual for scoring and interpretation, Forms G and H*. Itasca, IL: Riverside.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Collins, K. M. T., & Onwuegbuzie, A. J. (2002, April). *Relationship between reading ability and achievement in a graduate-level research methodology course*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Du Boulay, D. (1999). Argument in reading: What does it involve and how can students become better critical readers? *Teaching in Higher Education, 4*, 147-162.

Fleming, D. (1988, April). *The literature on teacher utilization of research: Implications for the school reform movement*. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.

Graham, S. (1992). Most of the subjects were White and middle class: Trends in published research on African Americans. *American Psychologist, 47*, 629-639.

Green, K. E., & Kvidahl, R. E. (1990, April). *Research methods courses and post-bachelor's education: Effects on teachers' research use and opinions*. Paper presented at the annual meeting of the American Educational Research Association, Boston, MA.

Hacker, D. J. (1998). Self-regulated comprehension during reading. In D. J. Hacker, J. Dunlosky, & A. C. Graesser (Eds.), *Metacognition in educational theory and practice* (pp. 165-192). Hillsdale, NJ: Lawrence Erlbaum.

Hedges, L. V., & Olkin, I. (1985). *Statistical methods for meta-analysis*. New York: Academic.

Kelly, R. R., Albertini, J. A., & Shannon, N. B. (2001). Deaf college students' reading

comprehension and strategy use. *American Annals of the Deaf, 146*, 385-400.

Lambert, Z. V., & Durand, R. M. (1975). Some precautions in using canonical analysis. *Journal of Market Research, XII*, 468-475.

Lammers, W. J., Onwuegbuzie, A. J., & Slate, J. R. (2001). Academic success as a function of the sex, class, age, study habits, and employment of college students. *Research in the Schools, 8*, 71-81.

Levin, J. R. (1995, April). *The consultant's manual of researchers' common stat-illogical disorders*. Paper presented at the annual meeting of the American Psychological Association, Toronto, Canada.

Onwuegbuzie, A. J. (1999a). Underachievement of African-American graduate students in research methodology classes: Possible implications for the supply of school administrators. *The Journal of Negro Education, 67*, 67-78.

Onwuegbuzie, A. J. (1999b). Statistics anxiety among African-American graduate students: An affective filter? *Journal of Black Psychology, 25*, 189-209.

Onwuegbuzie, A. J., & Collins, K. M. T. Reading comprehension among graduate students. *Psychological Reports, 90*, 879-882.

Onwuegbuzie, A. J., & Daniel, L. G. (2002). Uses and misuses of the correlation coefficient. *Research in the Schools, 9*, 73-90.

Onwuegbuzie, A. J., & Daniel, L. G. (in press). Typology of analytical and interpretational errors in quantitative and qualitative educational research. *Current Issues in Education*.

Onwuegbuzie, A. J., DaRos, D. A., & Ryan, J. (1997). The components of statistics

anxiety: A phenomenological study. *Focus on Learning Problems in Mathematics, 19*, 11-35.

Onwuegbuzie, A. J., Slate, J. R., & Schwartz, R. A. (2001). The role of study skills in graduate-level educational research courses. *Journal of Educational Research, 94, 238-246.*

Pritchard, R. E., Romeo, G. C., & Muller, S. A. B. (1999). Integrating reading strategies into the accounting curriculum. *College Student Journal, 33*, 77-81.

Rackliffe, G. (1988, April). *Obstacles to teacher use of the knowledge base for school reform*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Rao, C. R. (1952). *Advanced statistical methods in biometric research*. New York: Wiley.

Ravid, R., & Leon, M. R. (1995, April). *Students' perceptions of the research component in Master's level teacher education programs*. Paper presented at the American Educational Research Association, San Francisco, CA.

Robinson, D. H., & Levin, J. R. (1997). Reflections on statistical and substantive significance, with a slice of replication. *Educational Researcher, 26*, 21-26.

Spring, C. (1985). Comprehension and study strategies reported by university freshmen who are good and poor readers. *Inst-lion Science, 14*, 157-160.

Thompson, B. (1980, April). *Canonical correlation: Recent extensions for modelling educational processes*. Paper presented at the annual meeting of the American Educational Research Association, Boston, MA.

Thompson, B. (1984). *Canonical correlation analysis: Uses and interpretations*. Newbury

Park, CA: Sage. (ERIC Document Reproduction Service No. ED 199 269)

Thompson, B. (1988, April). *Canonical correlation analysis: An explanation with comments on correct practice.* Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA. (ERIC Document Reproduction Service No. ED 295 957)

Thompson, B. (1990, April). *Variable importance in multiple regression and canonical correlation.* Paper presented at the annual meeting of the American Educational Research Association, Boston, MA. (ERIC Document Reproduction Service No. ED 317 615)

United States Department of Education, (1995). *Digest of educational statistics.* Washington, DC: Author.

Van Lanen, R. J., Lockie, N. M., & McGannon, T. (2000). Predictors of nursing students' performance in a one-semester organic and biochemistry course. *Journal of Chemical Education, 77,* 767-770.

Wood, P. H. (1982). The Nelson-Denny Reading Test as a predictor of college freshman grades. *Educational and Psychological Measurement,* 42, 575.

Zabrucky, K., & Ratner, H. H. (1992). Effects of passage type on comprehension monitoring and recall in good and poor readers. *Journal of Reading Behavior, 24,* 373-391.

Zhu, E. (1999). Hypermedia interface design: The effects of number of links and granularity of nodes. Journal of Educational Multimedia and Hypermedia, 8, 331-358.

Table 1

Means and Standard Deviations Pertaining to Reading Ability and Research Achievement Scores

Measure	*M*	*SD*
Reading Comprehension	58.00	18.97
Reading Vocabulary	59.29	18.30
Midterm Examination	80.60	18.91
Final Examination	80.71	16.58

Table 2

Means and Standard Deviations Pertaining to Reading Comprehension and Reading Vocabulary Across Studies

		Reading Comprehension		Reading Vocabulary	
Study	*n*	*M*	*SD*	*M*	*SD*
Current	105	58.00	18.97	59.29	18.30
Brown et al. (1993)	5,000	61.60	11.94	64.56	11.46
Onwuegbuzie and Collins (2002)	59	73.00	5.28	69.63	6.09
Collins and Onwuegbuzie (2002)	71	69.45	5.17	68.85	6.20

Table 3

Intercorrelations Among Reading Ability and Research Achievement Measures

Measure	1	2	3
1. Reading Comprehension			
2. Reading Vocabulary	.66*		
3. Midterm	.33*	.38*	
4. Final	.46*	.48*	.80*

* Statistically significant after the Bonferroni adjustment.

Table 4

Canonical Solution for First Function: Relationship Between Reading Ability Scores and Research Methodology Achievement Scores

Variable	Standardized Coefficient	Structure Coefficient	Structure Coefficient^2
Reading Ability Dimension:			
Reading Comprehension	0.50*	0.90*	0.81
Reading Vocabulary	0.59*	0.93*	0.86
Research Achievement:			
Midterm Score	-0.05	0.77*	0.59
Final Score	1.04*	0.99*	0.98

*Loadings with effect sizes larger than .3 (Lambert & Durand, 1975)

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

ERIC Educational Resources Information Center

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: LEVEL OF READING ABILITY AMONG AFRICAN-AMERICAN GRADUATE STUDENTS	
Author(s): KATHLEEN M. T. COLLINS + ANTHONY J. ONWUEGBUZIE	
Corporate Source:	Publication Date: 2002

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

Level 1 ↑ ☑

Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) and paper copy.

The sample sticker shown below will be affixed to all Level 2A documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2A

Level 2A ↑ ☐

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only.

The sample sticker shown below will be affixed to all Level 2B documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

Level 2B ↑ ☐

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only.

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Sign here, please

Signature:	Printed Name/Position/Title: ANTHONY J. ONWUEGBUZIE
Organization/Address: SCHOOL OF EDUCATION, HOWARD UNIVERSITY, 2441 4TH STREET, NW, WASHINGTON DC 20059	Telephone: 202-249-0416 FAX: 202-249-6447
	E-Mail Address: tonyonwuegbuzie@aol.com Date: 11/6/02

(Over)

III. DOCUMENT AVAILABILITY INFORMATION (FROM NON-ERIC SOURCE):

If permission to reproduce is not granted to ERIC, or, if you wish ERIC to cite the availability of the document from another source, please provide the following information regarding the availability of the document. (ERIC will not announce a document unless it is publicly available, and a dependable source can be specified. Contributors should also be aware that ERIC selection criteria are significantly more stringent for documents that cannot be made available through EDRS.)

Publisher/Distributor:
Address:
Price:

IV. REFERRAL OF ERIC TO COPYRIGHT/REPRODUCTION RIGHTS HOLDER:

If the right to grant this reproduction release is held by someone other than the addressee, please provide the appropriate name and address:

Name:
Address:

V. WHERE TO SEND THIS FORM:

Send this form to the following ERIC Clearinghouse:

ERIC CLEARINGHOUSE ON ASSESSMENT AND EVALUATION
UNIVERSITY OF MARYLAND
1129 SHRIVER LAB
COLLEGE PARK, MD 20742-5701
ATTN: ACQUISITIONS

However, if solicited by the ERIC Facility, or if making an unsolicited contribution to ERIC, return this form (and the document being contributed) to:

ERIC Processing and Reference Facility
4483-A Forbes Boulevard
Lanham, Maryland 20706

Telephone: 301-552-4200
Toll Free: 800-799-3742
FAX: 301-552-4700
e-mail: ericfac@inet.ed.gov
WWW: http://ericfacility.org

EFF-088 (Rev. 2/2001)